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# Glacier retreat and projected river regime changes in the hydrologically highly-coupled Virkisjökull catchment, Iceland

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Virkisjökull, an outlet glacier of the Oræfajökull icecap in SE Iceland, currently has 60% glacier cover, though this is reducing due to glacier retreat. Intensive monitoring over the last 4 years includes measurement of measuring ice ablation, proglacial discharge, dye-tracing of flow pathways, and deployment of three automatic weather stations at altitudes up to 880 m. These data calibrate a distributed hydrological model (WaSIM) to project potential river regime during stages of glacier retreat. Results show: (1) glacier hypsometry sensitises the catchment to a disproportionately rapid increase in runoff as the snowline rises onto a gentle ice cap resulting in in a potential annual increase in river discharge of up to 37% (2) a dominantly channelized glacial drainage system in all seasons with a rapid runoff response to melt: englacial flow of 0.58 m s-1 is comparable to the proglacial river velocity; and (3) longer-term, reduced glacier cover and snow storage will lead to a discharge regime dominated by short-term precipitation events in all seasons, and a reduced influence of the seasonal meltwater discharge peak. The study demonstrates the importance of glacier hypsometry above the present ELA as an influence on catchment hydrological response to potential climate warming.